

binarizing means for generating binarized data from an image signal corresponding to an image of the dot code read by said code reading means; and

information reproducing means for restoring binarized data generated by said binarizing means to [original] the multimedia information and to reproduce the multimedia information, wherein said binarizing means includes:

[region] image dividing means for dividing the [picked up screen] image of the dot code into a plurality of regions;

characteristic [amount] value extracting means for extracting [the] a characteristic [amount] value for binarization in [region units divided by said region dividing means] each of said plurality of regions;

threshold value calculating means for calculating [the] a threshold value for binarization in accordance with the characteristic [amount] value extracted by said characteristic [amount] value extracting means; and

said binarizing means binarizing the image signal corresponding to the image of the dot code based on [threshold value determining means for binarizing the image signal with] the threshold value calculated by said threshold value calculating means.

22. (Amended) An information reproducing system according to claim 21, wherein

said information recording medium has a reference [region  
for extracting the characteristic amount] area from which said  
5 characteristic value is extracted, and

C  
said [region] image dividing means divides the [region]  
image of the dot code in such a manner that [the divided region]  
each of said plurality of regions includes at least one reference  
[region] area.

3/  
23. (Amended) An information reproducing system according  
to claim 22, wherein

said reference [region] area is at least one of a marker and  
an inhibition region adjacent to said marker, and

5 said characteristic [amount] value extracting means extracts  
the characteristic [amount] value from the [region] reference  
area.

4/  
24. (Amended) An information reproducing system according  
to claim 21, wherein said characteristic [amount] value  
extracting means extracts [the] a maximum value of [the] a  
luminance [in each of the divided regions].

5  
25. (Amended) An information reproducing system according  
to claim 24, wherein said characteristic [amount extract] value  
extracting means has maximum value averaging means which extracts  
the maximum value of the luminance [in each of the divided

5 regions] and which averages the extracted maximum value in at least two [or more adjacent] fields or frames [in terms of time] adjacent in time to each other.

26. (Amended) An information reproducing system according to claim 21, wherein

5 said characteristic amount extracting means extracts [the] a maximum value of [the] a luminance of each of the [divided] plurality of regions as a first characteristic [amount] value and extracts [the] a minimum value of the luminance [of the overall screen] as a second characteristic [amount] value, and

10 said threshold value calculating means calculates the threshold value [for each region] from the maximum value and the minimum value of the luminance in accordance with a predetermined interior division ratio.

27. (Amended) An information reproducing system according to claim 26, wherein

said code reading means continuously read the dot code images, and

5 the minimum value of the luminance is extracted from one of the previous field and frame.

28. (Amended) An information reproducing system according to claim 26, wherein said characteristic [amount extract] value

extracting means has maximum value averaging means which extracts the maximum value of the luminance [in each of the divided regions] and which averages the extracted maximum value in at least two [or more adjacent] fields or frames [in terms of time] adjacent in time to each other.

9/29. (Amended) An information reproducing system comprising:

code reading means for reading a desired dot code from an information recording medium on which multimedia information including at least any one of audio information, image information and digital code data has been recorded in the form of a dot code which can optically be read;

binarizing means for generating binarized data from an image signal corresponding to the dot code read by said code reading means; and

information reproducing means for restoring binarized data generated by said binarizing means to [original] the multimedia information and to reproduce the multimedia information, wherein said binarizing means includes:

peak value detection means for detecting [the] a maximum value and [the] a minimum value of [the] a luminance from a predetermined detection region;

code detection means for detecting whether or not a code exists in said predetermined detection region;

20 minimum value replacing means for replacing the minimum  
value in the predetermined detection region with the minimum  
value of one of the previous field and frame [in a case where]  
when said code detection means does not detect a code; and  
threshold value calculating means for calculating the  
25 threshold value for binarization for the [same] predetermined  
detection region of one of a next field and a next frame from the  
detected maximum value and the detected or replaced minimum value  
in accordance with a predetermined interior division ratio.

10  
30. (Amended) An information reproducing system according  
to claim 29, wherein said code detection means has peak ratio  
determining means for determining whether or not [the] a ratio of  
peak values detected by said peak value detection means is larger  
5 than a predetermined value.

11  
31. (Amended) An information reproducing system  
comprising:

code reading means for reading a desired dot code from  
an information recording medium on which multimedia information  
including at least any one of audio information, image  
5 information and digital code data has been recorded in the form  
of a dot code which can optically be read;

binarizing means for generating binarized data from an image  
signal corresponding to the dot code read by said code reading  
means; and

information reproducing means for restoring binarized data  
generated by said binarizing means to [original] the multimedia  
information and to reproduce the multimedia information, wherein  
said binarizing means includes:

peak value detection means for detecting [the] a maximum  
value and [the] a minimum value of [the] a luminance from a  
predetermined detection region;

code detection means for detecting whether or not a code  
exists in said predetermined detection region;

minimum value replacing means for replacing the minimum  
value in the predetermined detection region with the minimum  
value of the adjacent detection region [in a case where] when  
said code detection means does not detect a code; and

threshold value calculating means for calculating the  
threshold value for binarization for the [same] predetermined  
detection region of one of a next field and a next frame from the  
detected maximum value and the detected or replaced minimum value  
in accordance with a predetermined interior division ratio.

32. (Amended) An information reproducing system according  
to claim 31, wherein said code detection means has peak ratio  
determining means for determining whether or not [the] a ratio of

C<sub>5</sub> peak values detected by said peak value detection means is larger than a predetermined value.

C<sub>2</sub> 36. (Amended) An information recording medium for use in an information reproducing system having code reading means for reading a desired dot code from an information recording medium on which multimedia information including at least any one of  
5 audio information, image information and digital code data has been recorded in the form of a dot code which can optically be read;

binarizing means for generating binarized data from an image signal corresponding to the dot code read by said code reading means; and information reproducing means for restoring binarized  
10 data generated by said binarizing means to [original] the multimedia information and to reproduce the multimedia information, said information recording medium comprising:

15 data dots which correspond to the contents of multimedia information and which can optically be read; and

a reference dot serving as a reference when said binarizing means detects [the] a maximum value and [the] a minimum value of [the] an image signal level corresponding to the dot code, detects a dot from a code data binarized [by] based on a  
20 threshold value calculated from the maximum vale and the minimum value in accordance with a predetermined interior division ratio

Pub  
DE  
C12  
and modifies the interior division ratio in such a manner that area of the detected dot approaches a predetermined target value.

14  
37. (Amended) An information recording medium according to claim 36,<sup>13</sup> wherein a plurality of the reference dots are recorded in an image pickup region of the information recording medium.

Pub  
DE  
15  
38. (Amended) An information recording medium according to claim 36,<sup>13</sup> wherein said information recording medium has a reference [region] area for use when said binarizing means extracts the characteristic amount for binarization.

16  
39. (Amended) An information recording medium according to claim 36,<sup>13</sup> wherein said information recording medium has dot interval measuring dots for measuring a dot interval for correcting at least one of the area of the [reference] dot  
5 detected by said binarizing means and the predetermined target value.

Pub  
DE  
17  
40. (Amended) An information recording apparatus for recording multimedia information including at least any one of audio information, image information and digital code data in the form of a dot code which can optically be read, comprising:



5 reference dot recording means for recording at least two types of reference dots having at least different areas [of] or shapes;

reference dot reading means for reading the reference dots recorded by said reference dot recording [means to binarize] by binarizing the read reference dots;

reference dot selection means for [subjecting the area of each] selecting a reference dot that enables a difference between an area of each reference dot read by said reference dot reading means and a predetermined [reference] target value to [a comparison to select a reference dot having the different] become smaller than a predetermined [threshold] value; and

recording means for recording a dot code corresponding to multimedia information in accordance with the reference dot selected by said reference dot selection means.

41. (Amended) An information recording apparatus according to claim 40, wherein said at least two or more types of said reference dots are recorded in such a manner that at least one of the area and the shape [is different at each of predetermined steps of a minimum resolving power of said information recording apparatus] varies in units of a predetermined number of minimum print units.

19  
42. (Amended) An information recording apparatus for recording multimedia information including at least any one of audio information, image information and digital code data in the form of a dot code which can optically be read, comprising:

5 reference dot recording means for recording reference dots having different recording densities;

C2  
reference dot reading means for reading the reference dots recorded by said reference dot recording means to binarize the read reference dots;

10 recording density adjustment means for [subjecting the]  
adjusting a recording density such that a difference between an  
area of each of the reference dots read by said reference dot reading means and a predetermined [reference] target value [to a comparison to adjust the recording density in such a manner that  
15 the difference is] becomes smaller than a predetermined [threshold] value; and

recording means for recording a dot code corresponding to multimedia information in accordance with the recording density adjusted by said recording density adjustment means.

20  
43. (Amended) An information recording apparatus for recording multimedia information including at least any one of audio information, image information and digital code data in the form of a dot code which can optically be read, comprising:

5 reference dot recording means for recording at least two or more types of reference dots having different recording densities;

reference dot reading means for dividing a picked up screen in such a manner that only one reference dot recorded by said

10 reference dot recording means is included in a divided region and binarizing each divided region to read the reference dot [to binarize the reference dot];

C2  
15 [density selection means for subjecting the] recording density adjustment means for adjusting a recording density such that a difference between an area of each reference dot read by said reference dot reading means and a predetermined [reference] target value [to a comparison and for selecting the density of the reference dot having the difference] becomes smaller than a predetermined [threshold] value; and

20 recording means for recording a dot code corresponding to multimedia information in accordance with the recording density selected by said density selection means.